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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/03605

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : f16l 25/00, 55/00
 US CL : 285/12, 133.11, 179

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
 U.S. : 285/12, 133.11, 179

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 6,464,266 A (O'Neill et al) 15 October 2002 (15.10.2002), entire document.	10 and 13
A	US 6,422,607 A (Kirby) 23 July 2002 (23.07.2002), entire document.	1
A	US 5,375,887 A (Johnson) 27 December 1994 (12.27.1994), entire document.	1
X	US 6,547,159 A (Westby) 15 April 2003 (15.04.2003), entire document.	1-9, 11, 12, 14-25
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Y		10 and 13

 Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier application or patent published on or after the international filing date
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- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

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later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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document member of the same patent family

Date of the actual completion of the international search

14 December 2003 (14.12.2003)

Date of mailing of the international search report

04 JUN 2004

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